5/16/86

116002
SHAUGHNESSY NO.

REVIEW NO.

EEB REVIEW

DATE: IN 11/15/85 OUT MAY 16 1986

FILE OR REG. NO. 464-EUP-IT

PETITION OR EXP. PERMIT NO.

DATE OF SUBMISSION 09/16/85

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TYPE PRODUCT(S): I, D, H, F, N, R, S Herbicide

DATA ACCESSION NO(S).

PRODUCT MANAGER NO. R. Taylor (25)

PRODUCT NAME(S) Garlon 3A

COMPANY NAME Dow Chemical U.S.A.

SUBMISSION PURPOSE Proposed EUP for use on aquatic sites

SHAUGHNESSY NO.	CHEMICAL & FORMULATION	% AI
116002	3,5,6-trichloro-2-pridinyl-	
	oxyacetic acid as the	
	triethylamine salt	44.4

EEB REVIEW

Triclopyr

100.0 Submission Purpose and Label Information

100.1 Submission Purpose and Pesticide Use

Proposed Experimental Use Permit (EUP) for Garlon 3A to control woody plants and broadleaf weeds on stream, canal, and ditch banks and in ponds, lakes, marshes, and reservoirs. In addition, water, fish, and shellfish residue testing will be completed along with an aquatic field dissipation study.

100.2 Formulation Information

Active Ingredient:	
Triclopyr 3,5,6-trichloro-2-pyridinyloxyacetic acid as the triethylamine salt	44.4%*
Inert Ingredients:	55.6%

*Contains 3 pounds of triclopyr acid equivalent per gallon. Acid equivalent 31.8%.

100.3 Application Methods, Directions, Rates

This labeling for use only by employees and contractors of the U.S. Army Corps of Engineers, the U.S. Bureau of Reclamation, the Imperial Irrigation District (California) and The Dow Chemical Company at the application site of a cooperator and in accordance with the terms and conditions of the Experimental Use Permit.

WEED AND BRUSH CONTROL ON IRRIGATION CANAL BANKS, STREAM BANKS AND DITCH BANKS

For control of annual and perennial broadleaf weeds, apply 1/3 to 1 1/2 gallons of GARLON 3A Herbicide per acre in approximately 20 to 100 gallons water per acre. Treat when weeds are young and actively growing before the bud or early bloom stage.

For woody brush and patches of perennial broadleaf weeds, mix 2 to 3 gallons of GARLON 3A in enough water to make 20 to 100 gallons of total spray/acre. Wet foliage thoroughly.

Spraying Instructions

Apply with low pressure (10 to 40 psi) power spray equipment mounted on a truck, tractor or boat. Apply while traveling upstream to avoid accidental concentration of chemical into water.

Boom spraying onto water surface must be held to a minimum and no cross-stream spraying to opposite banks should be permitted. When spraying shoreline weeds, allow no more than 2-foot overspray onto water with an average of less than 1-foot overspray to prevent introduction of greater than negligible amounts of chemical into the water.

Do not graze treated areas for 1 year after treatment.

Do not fish treated streams for 24 hours within 5 miles downstream of treatment area.

Delay the use of treated waters for irrigation for 2 weeks after treatment unless a Dow approved assay shows that the water does not contain more than 0.01 ppm triclopyr. Do not treat irrigation ditches in areas where water will be used to overhead (sprinkler) irrigate susceptible crops especially grapes, tomatoes, and cotton.

AQUATIC WEED CONTROL

To be applied by federal, state, or local public agency personnel, trained in aquatic weed control, or by licensed commercial applicators under contract to the above agencies. For use only in ponds, lakes, reservoirs, marshes, bayous, drainage ditches, canals, rivers, and streams that are quiescent or slow moving.

Fish Toxicity

Oxygen Ratio - Fish breathe oxygen in the water and an acceptable water-oxygen ratio must be maintained. Decaying weeds use up oxygen. To avoid fish kill from decaying plant material do not treat more than one half the lake or pond at one time. For large bodies of weed infested waters leave buffer strips of at least 100 feet wide and delay treatment of these strips for 4 to 5 weeks or until the dead vegetation has decomposed.

Irrigation - Delay the use of treated waters for irrigation for 2 weeks after treatment unless a Dow approved assay shows that the water does not contain more than 0.01 ppm triclopyr acid. Do not treat irrigation ditches in areas where water will be used to overhead (sprinker) irrigate susceptible crops especially grapes, tomatoes, and cotton.

Potable Water - Delay the use of treated water for domestic purposes for a period of 2 weeks or until such time as a Dow approved assay shows that the water contains no more than 0.01 ppm trichlopyr acid.

Fishing - Do not fish treated areas within 24 hours after treatment.

DIRECTIONS FOR USE
WATER HYACINTH (Eichornia crassippe)

GARLON 3A Herbicide will control water hyacinth with surface and air applications.

Amounts to Use - 2 to 4 qts per acre. Spray the weed mass only. Use 4 qts when plants are matured or when the weed mass is dense.

When to Apply - Spray when water hyacinth plants are actively growing. Repeat as necessary to kill regrowth and hyacinth plants missed in the previous operation.

How to Use - Surface Application - Use power sprayers operated with a boom or spray gun mounted on a boat, tractor, or truck. Thorough wetting of foliage is essential for maximum control. Use 100 to 400 gallons per acre of spray mixture. Special precaution such as the use of low pressure, large nozzles, and thickening agents should be taken to avoid spray drift in areas of sensitive crops.

Air Application - Use Microfoil™ or THRU-VALVE™ boom or drift control additive mixed into the spray solution. Apply GARLON 3A through standard boom systems with a minimum of 5 gallons of total spray mix per acre. For Microfoil drift control spray systems, apply GARLON 3A Herbicide in 12 to 15 gallons spray mix per acre.

EURASIAN WATERMILFOIL (Myriophyllum spicatum)

GARLON 3A Herbicide will control watermilfoil with surface, subsurface, and air applications.

Amounts to Use - Apply GARLON 3A concentrate according to the rate chart so as to deliver 1 ppm to 2.5 ppm active ingredient concentration. The higher rate is used in areas of greater water exchange. These areas may require a repeat application.

Rate Chart for Application of GARLON 3A Herbicide to One Surface Acre.

Depth	Dosage in gallons for various concentrations in ppm			
	1.0 ppm	1.5 ppm	2.0 ppm	2.5 ppm
1 ft	1	1.5	2.0	2.5
2 ft	2	3.0	4.0	5.0
4 ft	4	6.0	8.0	10.0
6 ft	6	9.0	12.0	15.0

When to Apply - For best results, apply in spring or early summer when milfoil starts to grow. This timing can be checked by sampling the lake bottom in areas heavily infested with weeds the previous year.

How to Use - To control watermilfoil when less than 5 gallons of concentrate per acre is recommended, dilute the concentrate with water to apply a minimum of 5 gallons of spray mix per acre. Shoreline areas should be treated by subsurface injection applied by boat to avoid aerial drift. Treat from the shore outward. Do not apply when weather conditions favor drift from target area. Do not contaminate water by cleaning of equipment or disposal of wastes.

Open Water Areas - To reduce contamination and prevent undue exposure to fish and other aquatic organisms, do not treat water areas that are not infested with aquatic weeds.

Subsurface Application - Apply desired amount of GARLON 3A per acre as a concentrate directly into the water through boat-mounted distribution systems.

Surface Application - Apply desired amount of GARLON 3A per acre minimum spray volume 5 gallons mix per acre.

Air Application - Use Microfoil™or THRU-VALVE™ boom or thickening agents approved for use with submerged aquatic herbicides mixed into the spray solution. Apply GARLON 3A Herbicide through standard boom systems with a minimum of 5 gallons of spray mix per acre. For Microfoil drift control spray systems apply GARLON 3A in 12 to 15 gallons spray mix per acre.

NOTICE TO APPLICATORS

State and Local Coordination - Before application under any project program, coordination and approval of local and state authorities may be required, either by letter of agreement or issuance of special permits for such use.

This labeling must be in the possession of the user at the time of pesticide application.

100.4 Target Organisms

Irrigation canal banks, stream banks, and ditch banks - annual and perennial broadleaf weeds and woody brush such as saltcedar Tamarix ramosissima and willow Salix spp.

Ponds, lakes, reservoirs, marshes, bayous, drainage ditches, canals, rivers, and streams that are quiescent or slow moving - water hyacinth Eichornia crassippe, Eurasian watermilfoil Myriophyllum spicatum and hydrilla Hydrilla verticillata.

100.5 Precautionary Labeling

Bank treatments -

Do not graze treated areas for 1 year after treatment.

Do not fish treated streams for 24 hours within 5 miles downstream of treatment area.

Delay the use of treated waters for irrigation for 2 weeks after treatment unless a Dow approved assay shows that the water does not contain more than 0.01 ppm trichlopyr. Do not treat irrigation ditches in areas where water will be used to overhead (sprinkler), irrigate susceptible crops especially grapes, tomatoes, and cotton.

Aquatic treatments -

To avoid fish kill from decaying plant material do not treat more than one half the lake or pond at one time. For large bodies of weed infested waters leave buffer strips of at least 100 feet wide and delay treatment of these strips for 4 to 5 weeks or until the dead vegetation has decomposed.

Delay the use of treated waters for irrigation for 2 weeks after treatment unless a Dow approved assay shows that the water does not contain more than 0.01 ppm triclopyr acid. Do not treat irrigation ditches in areas where water will be used to overhead (sprinkler) irrigate susceptible crops especially grapes, tomatoes, and cotton.

Delay the use of treated water for domestic purposes for a period of 2 weeks or until such time as a Dow approved assay shows that the water contains no more than 0.01 ppm triclopyr acid.

Do not fish treated areas within 24 hours after treatment.

Do not apply when weather conditions favor drift from target area. Do not contaminate water by cleaning of equipment or disposal of wastes.

To reduce contamination and prevent undue exposure to fish and other aquatic organisms, do not treat water areas that are not infested with aquatic weeds.

101.0 Hazard Assessment

101.1 Discussion

Garlon 3A will be applied in Alabama, California, Florida, Georgia, Idaho, New Mexico, Texas, and Washington. Acreage treated will not be more than 40 acres per State per year.

Applications will be made to aquatic sites in the spring and summer. Some dormant applications may be made to ditch bank species.

The material will be applied by helicopter, ground equipment, or water craft. Test areas will be up to 25 acres in size.

A maximum dosage of 15 gallons of Garlon 3A (45 pounds ai) per acre or 2.5 ppm ai in water 6 ft deep is anticipated.

Four thousand gallons of Garlon 3A will be required for the study.

The EUP is required for 2 years. Garlon 3A is currently registered on forests, noncrop areas, industrial sites, rights-of-way, and fencerows.

101.2 Likelihood of Adverse Effects to Nontarget Organisms

Terrestrial

Triclopyr technical is slightly toxic on an acute basis to avian species and slightly to practically nontoxic on a subacute basis (mallard duck LD_{50} 1698 mg/kg, LC_{50} 5620 ppm; bobwhite quail LC_{50} 2934.7 ppm).

For a formulated product (64.7% triethylamine salt) the LD_{50} for the mallard duck is 3176 mg/kg and the LC_{50} is > 10,000 ppm. The bobwhite quail LC_{50} is 11,622 ppm.

Data on the rat indicate an LD_{50} of 713 mg/kg for both the male and female. An LD_{50} of 550 mg/kg is reported for the rabbit.

No data are available on toxicity to honeybees.

Assuming an application of 3 gallons Garlon 3A (9 pounds ai) to ditch banks the following maximum expected residues would result: short rangegrass 2160 ppm and long grass 990 ppm. These values are significantly below the LC_{50} values for Garlon 3A for both the mallard duck and bobwhite quail.

Based on data currently available, the proposed EUP does not pose a significant acute threat to avian species or mammals.

Aquatic

Data indicate that triclopyr technical is practically nontoxic to the rainbow trout, bluegill sunfish, and Daphnia magna, with LC_{50} values of 117 ppm, 148 ppm, and 132.9 ppm, respectively.

For M-3724, a triclopyr product containing 47.8% ai, LC_{50} values for the rainbow trout were 240 ppm and the bluegill sunfish 471 ppm.

Data on a 43.8% triethylamine salt formulation for estuarine species indicate the product is practically nontoxic to shrimp (Penaeus duorarum) LC_{50} 895 ppm, and the fiddler crab (Uca pugilator) LC_{50} > 1000 ppm. The product is slightly toxic to Eastern oyster Crassostrea virginica LC_{50} > 56 < 87 ppm.

A preliminary review of data recently submitted by the registrant indicates that Garlon 3A (64.7% triethylamine salt) may be characterized as practically nontoxic to rainbow trout, fathead minnow, bluegill sunfish, and Daphnia magna. LC_{50} values were 552, 846, 947, 891, and 1459 mg/L, respectively.

A life cycle test conducted on the fathead minnow resulted in an estimated MATC of > 162 < 253 mg/L with 96 hr LC_{50} values of 546 mg/L in a static test and 268 mg/L in a flow-through system.

In a life cycle test on Daphnia magna the following results were reported: static renewal LC_{50} 1120 mg/L, MATC > 80.7 < 149.0 mg/L; flow-through LC_{50} 1110 mg/L, MATC > 79.5 < 123.0 mg/L.

No data are available on growth and reproduction of non-target aquatic plants.

Using the maximum application rate of 15 gallons of Garlon 3A (45 lb ai), residues in a pond 6 feet deep would be 2.75 ppm. These levels are significantly below the LC_{50} values for aquatic organisms.

Based on data available and the limited acreage involved, the proposed EUP does not pose a significant threat to non-target aquatic species.

101.3 Endangered Species Considerations

Garlon 3A will be tested in six States, (Washington and Idaho have been dropped for 1986) on a relatively small acreage - 40 acres/State. Counties in the States where treatments are going to be made were identified by Joanne Miller, Team 25, Registration Division, after contacting Dow Chemical on May 9, 1986.

Based on information available to Ecological Effects Branch (EEB), no endangered species have been identified in the counties where testing is to be conducted. However, since the registrant indicated in the conversation with Ms. Miller that during the second year of the study new locations may be selected, the registrant must inform EEB prior to application of Garlon 3A in any locations other than those listed below:

State	County
Alabama	Houston
California	Imperial
Georgia	Seminole
Florida	Jackson
New Mexico	Dona Ana
Texas	El Passo

101.4 Adequacy of Toxicity Data

Studies previously submitted on the technical for avian single-dose LD_{50}, avian dietary LC_{50} (two species), avian reproduction (two species), aquatic invertebrate acute toxicity, and freshwater finfish (cold and warmwater species) are acceptable and fulfill the Guideline requirements.

For the triclopyr 64.7% triethylamine salt product, acceptable data are available on the single-dose LD_{50} on the mallard duck and avian dietary LC_{50} (two species). In addition, acceptable data are available on a 47.8% salt formulation for freshwater fish (cold and warmwater species) and estuarine species.

Six studies were submitted with the EUP under Accession Numbers 259511 and 259512. These studies are currently under review. The following is a brief preliminary summary for each study.

1. McCarty, W.M.; Alexander, H.C. (1978) Toxicity of Triclopyr, Triethylamine Salt to Freshwater Organisms. Environmental Sciences Research Laboratory, Dow Chemical U.S.A.

   The 96-hr LC_{50} values for the rainbow trout, fathead minnow, and bluegill sunfish were 552 (469-695) mg/L, 947 (838-1071) mg/L, and 891 (787-1011) mg/L, respectively.

The 48-hr LC_{50} values for Daphnia magna were 775 (614-1108) mg/L.

Data provided indicate that the triethylamine salt of triclopyr, 64.7% ai may be characterized as practically nontoxic to these aquatic organisms.

2. Batchelder, T.L.; Milazzo, D.P. (1982) Evaluation of GARLON 3A Herbicide in the Aquatic Environment. Enviromental Sciences Research Laboratory, Dow Chemical U.S.A.

The 96-hr LC_{50} value for the fathead minnow was reported to be 846 (603-1101) mg/L.

The 48-hr LC_{50} value for the aquatic invertebrate Daphnia magna was calculated to be 1459 (1023-1932) mg/L.

Data provided indicate that Garlon 3A may be characterized as practically nontoxic to these aquatic organisms.

3. Mayes, M.A.; Dill, D.C.; Mendoza, C.G.; Bodner, K.M. (1983) The Acute and Chronic Toxicity of Triclopyr (3,5,6-trichloro-2-pyridinyloxyacetic acid) Triethylamine Salt Solution to Fathead Minnows (Pimephales promelas rafinesque). ES-582. Environmental Sciences Research, Dow Chemical U.S.A.

Using the fathead minnow in a static test, the 96-hr LC_{50} was determined to be 546 (499-600) mg/L.

In a flow-through test, the 96-hr LC_{50} for the fathead minnow was 268 (231-311) mg/L, and the 192-hr LC_{50} 225 (197-259) mg/L.

Results of the embryolarvae test on fathead minnow indicated the estimated MATC, based on survival, lies between 162 and 253 mg/L. Expressed as the geometric mean of the high and low, the value is 202 mg/L.

These tests were conducted on Garlon 3A, 44.9% triethylamine salt.

4. Gersich, F.M.; Mendoza, C.G.; Hopkins, D.L.; Applegath S.L.; Bodner, K.M. (1982) The Acute and Chronic Toxicity of Triclopyr (3,5,6-trichloro-2-pyridinyloxyacetic acid) Triethylamine Salt Solution to Daphnia magna Straus. ES-583. Environmental Sciences Research, Dow Chemical U.S.A.

The 48-hr LC_{50} for Daphnia magna is 1170 (1030-1340) mg/L and the 21-day LC_{50} was reported to be 1140 (950-1590) mg/L.

The estimated MATC is > 80.7 < 149.0 mg/L. Expressed as the geometric mean the value is 110 mg/L.

These tests were conducted on Garlon 3A, 32.16% triclopyr 44.9%, triethylamine salt.

5. Gersich, F.M.; Hopkins, D.L.; Milazzo, D.P. (1985) The Development of Flow-through Acute and Chronic Test Methods for Daphnia magna Straus. ES-756. Mammalian and Environmental Toxicity, Dow Chemical U.S.A.

The 48-hr LC_{50} for Daphnia magna, flow-through test, was 1110 (980-1281) mg/L geometric mean of three tests.

The 21-day test in the flow-through system indicated the MATC lies between 79.5 and 123.0 mg/L and is 99.0 mg/L expressed as the geometric mean of the high and low chronic values.

These tests were conducted on triclopyr (32.6%), 44.9% triethylamine salt.

6. Batchelder, T.L. (1975) Environmental Analysis and Special Fish Toxicities of Two Triclopyr Formulations. ES-44. Environmental Sciences Research, The Dow Chemical Company.

The 96-hr LC_{50} for the rainbow-trout was 231.6 (220.3-242.3) mg/L and for the bluegill sunfish 482.5 (463.0-502.5) mg/L.

These results are for the M-3724, a formulation containing 43.8% triethylamine salt or 31.4% acid equivalent.

Prior to Section 3 registration, data on the effect of triclopyr to aquatic plants must be submitted. Test species required are: duckweed Lemna gibba, marine diatom Skeletonema costatum, blue-green alga Anabaena flos-aquae, freshwater green alga Selenastrum capricornutm, and a freshwater diatom.

101.5 Adequacy of Labeling

In the bank treatment section of the label, add "Do not contaminate water by cleaning of equipment or disposal of wastes" and "Do not apply when weather conditions favor drift from target area."

All other prepared labeling is adequate for this EUP.

102.0 Classification

No classification at this time.

103.0 Conclusions

EEB has reviewed the proposed EUP for Garlon 3A on aquatic sites. Based on the data available, the proposed EUP will not pose significant increased adverse effects to nontarget organisms.

Prior to Section 3 registration, data on the growth and reproduction of non-target aquatic plants (§158.150, 122-2) will be required.

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